30535

Endangered Species Act
COMPLIANCE

PROPOSED SOUTH INTERCEPTOR DITCH (SID) MAINTENANCE PROJECT

FINAL BIOLOGICAL SURVEY REPORT

DEPARTMENT OF ENERGY
ROCKY FLATS OFFICE
GOLDEN, CO

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1 0 INTRODUCTION

Correspondence between the Department of Energy Rocky Flats Office (DOE RFO) and the U S Fish & Wildlife Service (USFWS) (dated 18 September 1991) identified several proposed remedial action and operational projects at RFP which may require official (Section 7) consultation with USFWS regarding potential impacts to resources protected under the Endangered Species Act (ESA) [16 U S C 1531 *et seq*] Internal DOE RFO guidance further emphasized the need to insure compliance with applicable biological regulations before proceeding with the proposed South Interceptor Ditch (SID) project On 19 September 1991 DOE RFO met with USFWS Golden CO to discuss Rocky Flats Plant (RFP) compliance with the ESA

This report is concerned with two classes of species one of which is a subset of the other

Species of Concern (SOC species) T&E species plus those which are federal Category 1 2 or 3 species state threatened or endangered species or state species of concern

Threatened & Endangered (T&E species) are a subset of SOC species which includes only those listed (threatened or endangered) or proposed to list under federal regulations These are the species to which the ESA directly applies and the ones injury to which could result in civil and/or criminal penalties

At the meeting it was determined that consultation would be required on the proposed project To limit impacts to SID construction schedules DOE RFO requested that the consultation process be expedited To facilitate expeditious consultation DOE RFO and USFWS agreed that DOE RFO would prepare a report summarizing ecological survey data pertinent to SOC species collected during (a) performance of the 881 Hillside Operable Unit 1 (OU1) Environmental Evaluation (EE) and (b) special surveys on the SID project site USFWS visited the SID site the visits took place on 26 September 1991 and 17 October 1991

USFWS agreed to review the report to determine whether sufficient information had been collected to date to allow assessment of potential impacts to threatened or endangered species or their habitats in or near the SID project

Work on the SID Project is currently on hold pending adequate assessment of its potential impacts to SOC species and to meet the consultation requirements of the Fish and Wildlife Coordination Act (FWCA) [16 U S C 661 666c] and the Migratory Bird Treaty Act (MBTA) [16 U S C 703 712] Furthermore DOE RFO is undertaking development of (a) an addition to the Ecology SOP to direct the identification reporting and support of T&E species observed at RFP and (b) a RFP sitewide procedure to govern compliance with ESA with respect to future facility and remediation projects Both procedures are presently in draft form and under review by the Environmental Protection Agency (EPA) the Colorado Department of Health (CDH) USFWS and the Colorado Division of Wildlife (CDOW)

2 0 DESCRIPTION

2 1 Project Description

The purpose of the SID is to prevent potentially contaminated stormwater runoff from the south side of the developed RFP area from reaching Woman Creek and thereby flowing offsite The SID intercepts this runoff and carries it to Pond C 2 for storage sampling and analysis prior to discharge The SID has

been recently evaluated as being hydraulically unable to carry its design stormwater flows i e a 100 year 6 hour peak flow of 210 cfs

Maintenance of the SID will take place in two phases The first near term phase involves burning the vegetation in the channel bottom to improve flow rates while second phase involves the eventual excavation and dredging of the channel to return it to its original design capacity

The proposed near term action is the maintenance burning of heavy growths of vegetation primarily linear strands of cattails (approximately 0 4 hectares (approximately 0 9 acres)) in the SID The SID is approximately 2000 meters long covers a total area of approximately 1 8 hectares (approximately 4 5 acres) and is located on the south side of RFP immediately north of Woman Creek The need for this action is based on a lack of regular maintenance of the ditch which has resulted in siltation in culverts overgrowth of vegetation in the channel and sloughing of ditch banks This deterioration has significantly reduced the flow channel width and set the stage for possible overtopping during a 100 year or even smaller event Burning the ditch vegetation will provide an immediate increase in the present carrying capacity prior to heavy precipitation events that may occur during the spring of 1992

Proposed future maintenance activities will involve (a) excavation and re-grading of approximately 2000 meters of the SID to remove accumulated sediment (b) reconstruction of existing rock control structures and placement of additional rip-rap as required (c) removal and replacement of about five culverts and (d) construction of new concrete inlet structures within the SID The location for the proposed project is shown in Figure 1

2 2 Resource and Habitat Description

An updated list of SOC species which potentially exist at RFP is provided in Table 1 annotations show those with a documented presence at RFP and those with a documented presence at or near the project site

The Threatened and Endangered Species Evaluation Report, Rocky Flats Plant Site (April 4 1991) prepared by EG&G Rocky Flats Inc provides a broad picture of potential SOC species at RFP and provides the most recently published wetlands map habitat map and prairie dog colony map On 17 September 1991 USFWS transmitted to DOE RFO a list of additional SOC species these additional species were incorporated into Table 1 Also applicable to surveying for SOC species is the recent delineation of habitat types (updated habitat map to be finalized by November 1991)

The primary habitat type in the SID is tall marsh (i e cattail (*Typha latifolia* and *Typha angustifolia*)) bulrush (*Scirpus validus*) and related species The flora consists primarily of successional and rehabilitation species adjacent to the wetland species that have invaded the ditch from nearby wetland habitats Habitat types immediately adjacent to the SID include wet meadow short marsh mesic grassland rehabilitation and disturbed types Activities in and near the SID will affect approximately 1 8 hectares (approximately 4 5 acres)

3 0 SURVEY

3 1 Design

Methodologies used for ecological surveys at RFP are specified in the EG&G Environmental Management Department Standard Operating Procedures (SOP) Volume 5.0, Ecology These SOPs

have been approved for use on CERCLA/RCRA investigations by EPA CDH USFWS and the Colorado Division of Wildlife (CDOW) Each Ecology SOP specifies a Master's Degree and two years of field experience as the minimum qualifications required of personnel conducting the surveys

3 2 On Site Inspection

RFP ecology field programs which began in spring 1991 include the (a) Threatened and Endangered Species Evaluation Report Rocky Flats Plant Site (b) Baseline Wildlife/Vegetation Studies (c) OU1 environmental evaluation (EE) (d) OU2 EE (e) OU5 EE and (f) surveys specific to the SID project site In the aggregate these programs cover a survey area bounded on the west by a line 0 3 mile east of Highway 93 on the east by Indiana Street on the north by Highway 128 and on the south by a line 0 5 to 1 0 miles north of Highway 72 Ecology surveys conducted within OU1 OU2 OU5 and OU fringe areas have more densely spaced sampling locations then do surveys conducted in OU reference and baseline areas

The following types of ecological surveys were conducted throughout 1991 at or near the SID project site

Relative Abundance Transects One relative abundance transect (RA01A) was designed specifically to sample fauna along the SID from SW36 (near the west end of the SID) to Pond C 2 Two additional transects were aligned parallel to the ditch along Woman Creek and along the 881 Hillside respectively as part of the OU1 EE Observations of the fauna in association with the three transects have been made monthly or bi monthly since May 1991 each observation session required about one hour to complete All observations of vertebrates and selected invertebrates (e g butterflies) were tallied and assigned to habitat types Summaries were compiled in terms of species per unit time by habitat

Emlen Bird Transects One 1000 meter bird transect (BA01A) was designed specifically to sample bird populations in wetland types along the SID between Pond C 2 and SW36 Data have been compiled from this transect five times since May Bird numbers and perpendicular distances from the centerline of the ditch were recorded in order to compute bird densities (number per hectare) An additional eleven transects totalling 3300 meters have been configured within adjacent habitats along Woman Creek and the 881 Hillside each has been sampled five times since May Each sampling session required ten minutes to more than an hour to complete depending upon the transect length and the number of birds present

Small Mammal Transects Two 25 trap transects (MA02A & MA03A) were specifically designed to sample populations of small mammals along the ditch The sites were sampled over a four night period in mid May and again in late September for a total of 400 trap nights An additional 17 25 trap transects established in adjacent habitats along Woman Creek and the 881 Hillside were also sampled during spring and fall for a total of 3400 trap nights Personnel from S M Stoller Corporation have during the same period completed approximately 1000 trap nights in habitats adjacent to the SID in OU2 and OU5

Vegetation Transects Vegetation sampling was conducted in conjunction with the aforementioned bird and mammal transects within the ditch environment Data have been compiled on vegetation cover density composition richness and production from six 50 meter point intercept cover transects six 2x50 meter belt transects and from 60 0 25 m^2 production plots The vegetation in the ditch has been characterized and quantified using these techniques About 80

person hours have been devoted to this activity

Insect Sweep netting Insect populations have been characterized by sweep netting the aforementioned mammal transects on three occasions About 30 person hours have been required to complete this process

Large Mammal Pellet Counts Occurrence of deer and rabbits has been documented by counting pellet groups in conjunction with the sampling of small mammals at the sites previously enumerated About 8 person hours were required to complete this activity

Fish Surveys A minimum of two minnow traps were placed for a minimum of three nights at selected sites on the ditch in the spring and fall in order to determine which (if any) fish species were present SID sites sampled included SW36 SW38 SW70 SW63 SW46 and culverts in the lower parts (east end) of the ditch In order to characterize the ichthyofauna Ponds C 1 C 2 and eight sites along Woman Creek were sampled with a variety of equipment including gill nets minnow traps and electro fishing gear

SOC Species Surveys (General)

- Δ Prairie Dog Surveys In accordance with USFWS guidelines and directives surveys of prairie dogs have been conducted on a regular basis since February in order to ascertain the suitability of the RFP site for black footed ferrets Three small prairie dog colonies have been delimited on suitable maps About 40 person hours have been associated with this survey

- Δ Raptor Surveys Intensive searches for habitat appropriate for raptor nests were conducted through the late winter spring and early summer All observations of raptors have been recorded in a standardized format These activities have consumed about 70 person hours

- Δ Rare Plant Surveys From time to time throughout the growing season surveys were conducted for T&E species within suitable habitats Particular attention was paid to searching suitable habitat for Lady s Tresses (*Spiranthes diluvialis*) and the Colorado Butterfly Plant (*Gaura neomexicana*) About 30 person hours have been devoted to these activities

SOC Species Surveys (Specific) During the week of 7 11 October 1991 the phreatophytic zone of the SID and adjacent portions of Woman Creek and its tributaries were searched for SOC species with particular reference to the possible occurrence of *Spiranthes diluvialis* The xeric and transition portions of the corridor were carefully examined for the possible occurrence of *Aristida basiramea Gaura neomexicana* and other SOC plant species

Minnow traps were placed at an additional four sites on the SID and an additional 11 sites on Woman Creek and its tributaries in an attempt to ascertain the status of the Common Shiner (*Notropis comutus*) a Colorado State species of concern and the Plains Top Minnow (*Fundulus sciadicus*) a federal Category 2 species

Additional traplines were established in late September and early October in OU5 to the west of the project area in an attempt to better ascertain the range of *Zapus hudsonius preblei*

3 3 Interviews with Experts

EG&G has discussed the potential occurrence of *Spiranthes diluvialis Aristida basiramea Zapus hudsonius preblei Gaura neomexicana* and other SOC species with Dr Fred Harrington (Ebasco Services Inc) who currently serves as Field Supervisor for the sitewide biological baseline studies and for the OU1 EE Dr Harrington has in turn consulted with appropriate specialists in order to make a proper determination of the status of SOC species in or near the project site Dr Harrington has 32 years experience in ecosystem research planning and management including extensive experience with T&E species management his resume appears in Attachment A

3 4 Literature Review

The Threatened and Endangered Species Evaluation Report, Rocky Flats Plant Site (April 4 1991) provides a broad picture of potential SOC species at RFP and contains a literature review for those species Literature searches have been performed for all of the additional species on the USFWS list (Table 1) and are included as Attachment 2 in Identification and Reporting of Threatened and Endangered and Special Concern Species EMD Administrative Procedures Manual (3 21000 ADM) Procedure NEPA 12 (15 October 1991 draft)

4 0 RESULTS

These results represent ecological survey data collected between late winter 1991 and 11 October 1991 during the aforementioned surveys They also include all documented findings of SOC species at RFP that might be impacted by the proposed SID Project

4 1 Presence of Compliance Listed Species

Preble s Meadow Jumping Mouse One individual assigned to this species (*Zapus hudsonius preblei*) a federal Category 2 species was confirmed as having been captured and released in a rehabilitation habitat type transect (MR02A) about 20 meters south of the SID during the spring sampling season Attempts to trap *Zapus* in the vicinity of the SID during the fall period were unsuccessful This lack of success may have been due to (a) the hibernation behavior of *Zapus* (b) competition from high fall populations of deer mice (*Peromyscus maniculatus*) and meadow voles (*Microtus pennsylvanicus*)who enter the traps more aggressively or (c) the actual absence of *Zapus* from the vicinity of the SID Six individuals captured in the northern buffer zone in the spring were assigned to another non T&E species the Western Jumping Mouse (*Zapus princeps*) However determinations were tentative based solely on external charactenstics None of these were captured in the northern zone during the fall Since voucher specimens have not yet been taken documentation of the respective distributions of *Z. princeps* and *Z. hudsonius preblei* remain to be ascertained

Black footed Ferret Two small black tailed prairie dog colonies about 1000 meters northeast and 1500 meters east of the SID aggregated to about 10 and 5 hectares respectively Each contained fewer than 40 individuals The ferret (*Mustela nigripes*) a federal and state endangered species may be associated with prairie dog colonies above a certain size However given the small size of these prairie dog colonies it is extremely unlikely that *M nigripes* is present

Forktip Threeawn This species (*Aristida basiramea*) a Colorado State species of concern has been found just south of the west access road entering Rocky Flats growing on gravel scars bordering an old roadway 1000 meters to the west of the SID This gravel habitat can apparently support the species when other plants are absent and adequate moisture can accumulate Given

these habitat preferences it is highly unlikely that this species would be found in the SID and none have been observed there

Diluvium Lady s Tresses Appropriate habitat for the diluvium lady s tresses (*Spiranthes diluvialis*) a federal proposed endangered species includes the edge of wetlands dominated by sedges rushes and cattails such as that found in the SID Populations of the plant have been found in Jefferson and Boulder Counties on either side of the RFP site Given that the SID contains suitable habitat for this species there was a reasonable probability that the species might be found on the project site However an extensive search during the flowering period (reported as extending from early July to early October) of this species along the entire length of the SID yielded negative results

Colorado Butterfly Plant Appropriate habitat for the Colorado butterfly plant (*Gaura neomexicana* var *coloradensis*) a federal Category 2 species includes the transition zone between wetland bottoms and the drier uplands associated with wet meadow habitat Given that there is suitable habitat for this species adjacent to the SID there was a reasonable probability that the species might be found on the project site However an extensive search during the flowering period (reported as extending from early July to late September) of this species along the entire length of the SID yielded negative results

Bald Eagle Individuals of this species (*Haliaeetus leucocephalus*) a federal and state endangered species have been observed soaring over the developed area and flying over the northeast portion of the buffer zone None have been observed to roost or hunt on RFP and none have been observed in proximity to the SID

Peregrine Falcon Two individuals of this species (*Falco peregrinus*) a federal and state endangered species were observed at RFP in early fall One was flying from west to east near the west gate The other was observed perched on a powerline near Pond B 5 and made an attempt to capture a killdeer inbound to Pond B 5 However no nesting or roosting activities have been observed and none have been observed in proximity to the SID

Ferruginous Hawk This species (*Buteo regalis*) a federal Category 1 species was observed adjacent to the SID in winter spring and early summer A juvenile male was resident in the vicinity in the area for a six week period in early late spring and early summer nesting was not documented This individual was observed hunting primarily in the riparian zone of Woman Creek and along the 881 Hillside directly above the SID Most observations of this species have been in association with prairie dog colonies southeast of RFP

Swainson s Hawk A pair of this species (*Buteo swansonii*) a federal Category 3 species attempted to nest in early June in a cottonwood about 1000 meters southeast of the SID The nest was abandoned for unknown reasons in early July During this period members of the pair were not observed hunting in the vicinity of the SID although other observations of this species have been documented infrequently but widely on the RFP site

Other No additional SOC species are expected to occur with any degree of regularity in association with the SID

4 2 Presence of Critical Habitat

The SID is a man made structure that through lack of maintenance has become a jurisdictional

wetland and a suitable although potentially contaminated habitat for a variety of species However given that no T&E species have been identified in the SID and that similar habitat exists in abundance elsewhere on RFP this particular 1 8 hectares of wetland habitat should not be considered as critical to T&E species It would be prudent however to more fully determine the role (if any) that this habitat plays in the maintenance of *Zapus* populations

5 0 ANALYSIS OF POTENTIAL IMPACTS

5 1 Direct Impacts

The proposed maintenance burn is planned for the end of October after the on set of hibernation in the *Zapus* population and during the dormant period for the vegetation Burning will be done without the use of fuels Every effort will be made to avoid impacting the dormant plant roots located in the channel bottom This will leave the roots in place to limit migration of sediments and allow vegetation to return during the next growing season Burning with these caveats is expected to have little long term direct impact on plant or animal populations as the vegetation should return during the 1992 growing season The new growth should be more vigorous and the forage more nutritious due to the release of nutrients during the burn

The principal impacts from burning will be loss of food ad cover for small mammals and birds during the interval between burning and regrowth The small population of muskrats (*Ondatra zibethicus*) is not expected to be adversely affected since they feed on the root stalks of *Typha* and related species that will not be destroyed by burning Pheasants (*Phasianus colchicus*) which tend to utilize stands of *Typha* for cover elsewhere in the region do not regularly occur in the vicinity of the SID Red winged Blackbirds (*Agelaius phoeniceus*) Song Sparrows (*Melospiza melodia*) and other resident birds that nest in *Typha* can be expected to take advantage of the regrowth at the time of initiation of nesting Ash and debris from the burning will wash into Pond C 2 this is not expected to impact the large population of Fathead Minnows that have been recorded there

Excavation of the channel and re building of control structures will result in the total destruction of all habitats along the length of the SID channel Because similar habitat is available in the immediate vicinity loss of this particular habitat is not anticipated to have any long term direct impact on the species that currently utilize it

Although the 1 8 hectares of wetland habitat in the SID do not represent a substantial portion of the total wetland habitat present at RFP they comprise none the less a man made jurisdictional wetland as defined in 33 CFR 328 3(b) and 40 CFR 230 3(t) Permission was received on 18 October 1991 from the Corps of Engineers (COE) for the maintenance burn which will take place as a maintenance activity under 10 CFR 1022 5(g) However any proposed long term or permanent impacts (such as excavation) to this wetland habitat may have to be mitigated in conformance with applicable regulations and USFWS guidance

5 2 Indirect Impacts

The maintenance burn due to its planned occurrence after thge onset of hibernation and dormancy is expected to have a negligible potential for indirect impacts on SOC species living beyond the actual boundaries of the SID project

Although *Zapus* (a federal Category 2 species) often occurs near water the ditch environment (i e

cattail rush sedge etc) does not represent typical habitat for this species Thus loss of this wetland and marsh habitat due to excavation is not expected to have an adverse impact on the foraging activities of this particular SOC species

The proposed excavation activities could however have an adverse impact on the dynamics of jumping mouse populations living adjacent to the southern edge of the construction site As a general rule there should be no earth disturbing activities within 200 meters of *Zapus* nesting areas While it is difficult to predict the magnitude and types of impacts to this species (and perhaps other SOC species) due to vibration noise and other physical disturbances emanating from construction activities attention has to be called to the fact that such impacts could occur

There is also a possibility for increased sedimentation into Woman Creek from excavation activities at the SID Project Due to the shallow nature of the creek even a small increase in sedimentation levels could greatly affect the macrobenthos and fish populations in the creek Seven non SOC species of fish have been identified in Woman Creek Stoneroller (*Campostoma anomalum*) Creek Chub (*Semotilus atromaculatus*) Golden Shiner (*Notemigonus crysoleucas*) Fathead Minnow (*Pimephales promelas*) Largemouth Bass (*Micropterus salmoides*) Green Sunfish (*Lepomis cyanellus*) and the Western White Sucker (*Catostomus commersoni*) The two SOC fish species that could be present at RFP the Common Shiner (*Notropis comutus*) a Colorado State species of concern and the Plains Topminnow (*Fundulus sciadicus*) a federal Category 2 species have yet to be observed in Woman Creek

In addition disturbance of the land around the SID due to excavation activities could lead to the invasion of opportunistic plant species that are less desirable as forage for small mammal and bird populations

5 3 Cumulative Impacts

The maintenance burn due to its duration and seasonal timing is not expected to contribute to cumulative impacts on SOC species living beyond the actual boundaries of the SID project

Immediately to the west of the SID in the upper Woman Creek drainage are the Old Landfill and Ashpits sites which are scheduled for remediation however specific actions for remediation of these sites have yet to be determined The potential for cumulative impacts to SOC species either from SID excavation activities other projects along Woman Creek or the 881 Hillside French Drain Project construction activities certainly exists However sufficient information is not presently available to fully verify the existence or characterize the extent of cumulative impacts

5 4 Platte River Hydrology

In order to avoid impacts to endangered species in Nebraska that are dependent upon downstream flows water related projects at RFP must demonstrate a zero net depletion to the Platte River basin

The SID intercepts runoff from the 881 Hillside and carries it to Pond C 2 for storage sampling and analysis prior to discharge Since the main function of Pond C 2 is spill control attempts are made to keep the volume of water in it as low as possible Currently all water captured by the SID that accumulates in Pond C 2 is eventually discharged via pipeline to the diversion ditch around the Great Western Reservoir which carries the water to Walnut Creek Big Dry Creek and eventually the South Platte River Discharge volume is approximately 20 million gallons (approximately 58 af) annually Discharges are intermittent depending upon rainfall and accumulated volume and generally occur only twice a year during an eight

week period between March and early June and during a four week period between October and November

Repair of the SID is intended to improve flow rates rather than to increase volume Historical discharges of all water will continue after repair of the SID thus no net depletion of downstream flows is expected To the contrary it is estimated that clearing the ditch will yield shorter flow times and less seepage loss resulting in an approximately 10% higher capture rate (approximately 2 million gallons (approximately 6 af)) over the course of an average year

6 0 DETERMINATION

General and focused surveys have found no evidence of T&E species on or in proximity to the SID project site

Based on the data currently available DOE RFO has determined that the maintenance burn of the SID proposed to occur before the end of October will have no adverse direct indirect or cumulative impacts on SOC species in or near the project

Based on the data currently available DOE RFO has determined that any excavation or re building of the SID could have adverse direct indirect or cumulative impacts on SOC species in or near the project Before proceeding with any excavation activities DOE RFO proposes to more fully characterize the role (if any) that this habitat plays in the maintenance of *Zapus* populations

Based on the data currently available DOE RFO has determined that burning excavation or re building of the S'D will cause no net depletion to the Platte River basin [1]

1) Prepared by EG&G Rocky Flats EM/NEPA Division (303) 273 6188 Report originally compiled and written by Ms Meredith L. Brogden re written and edited by Dr Bruce K. Hope reviewed by Mr Bruce J Bevirt Dr Fred Harrington Mr Scott McGlochlin, and Dr Lawrence E Woods Platte River hydrology analysis provided by Mr Eric Mendes EG&G Rocky Flats EM/Surface Water Division Information on the types and results of surveys conducted were transcribed from a report (Letter RFEV3 EDEN EGRF M 015) prepared by Dr D Jean Tate (Ebasco Services) and Dr Fred Harrington (Ebasco Services) under EM/NEPA Division Contract BA64980EB

TABLE 1	SOC SPECIES COMPLIANCE LIST FOR THE SID PROJECT				
GROUP	COMMON NAME	SCIENTIFIC NAME	STATUS	RFP	SITE
PLANTS	Forktip Threeawn	*Aristida basiramea*	CO	yes	no
	Colorado Butterfly Plant	*Gaura neomexicana var coloradensis*	C2		
	Toothcup	*Rotala ramosior*	CO		
	Diluvium Lady s Tresses	*Spiranthes diluvialis*	P		
AMPHIBIANS & REPTILES	Northern Leopard Frog	*Rana pipens spp*	C2	yes (?)	no
	Texas Horned Lizard	*Phrynosoma cornutum*	C2		
FISH	Plains Topminnow	*Fundulus sciadicus*	C2		
	Common Shiner	*Notropis cornutus*	CO		
BIRDS	Peregrine Falcon	*Falco peregrinus*	E	yes	no
	Bald Eagle	*Haliaeetus leucocephalus*	E	yes	no
	White faced Ibis	*Plegadis chichi*	C2		
	Ferruginous Hawk	*Buteo regalis*	C1	yes	forage
	Whooping Crane	*Grus americana*	E		
	Harlequin Duck	*Histrionicus histrionicus*	C2		
	Western Snowy Plover	*Charadrius alexandrinus nivosus*	C2		
	Mountain Plover	*Charadrius montanus*	C2		
	Piping Plover	*Charadrius melodus*	T		
	Long billed Curlew	*Numenius americanus*	C2		
	Least Tern	*Sterna antillarum*	E		
	Black Tern	*Chlidonias niger*	C2		
	Swainson s Hawk	*Buteo swainsoni*	C3	yes	forage
	Yellow billed Cuckoo	*Coccyzus americanus*	C3B		
MAMMALS	Swift Fox	*Vulpes velox*	C2		
	Black footed Ferret	*Mustela nigripes*	E		
	Prebles Meadow Jumping Mouse	*Zapus hudsonius preblei*	C2	yes	close
	Fringed Myotis	*Myotis thysanodes*	C2		

STATUS

(E) endangered species
(T) threatened species
(CO) Colorado State species of concern
(P) Proposed
(C1) Federal Category 1 (propose to list)
(C2) Federal Category 2 (appropriate to list but no data)
(C3) Federal Category 3 (formerly proposed)

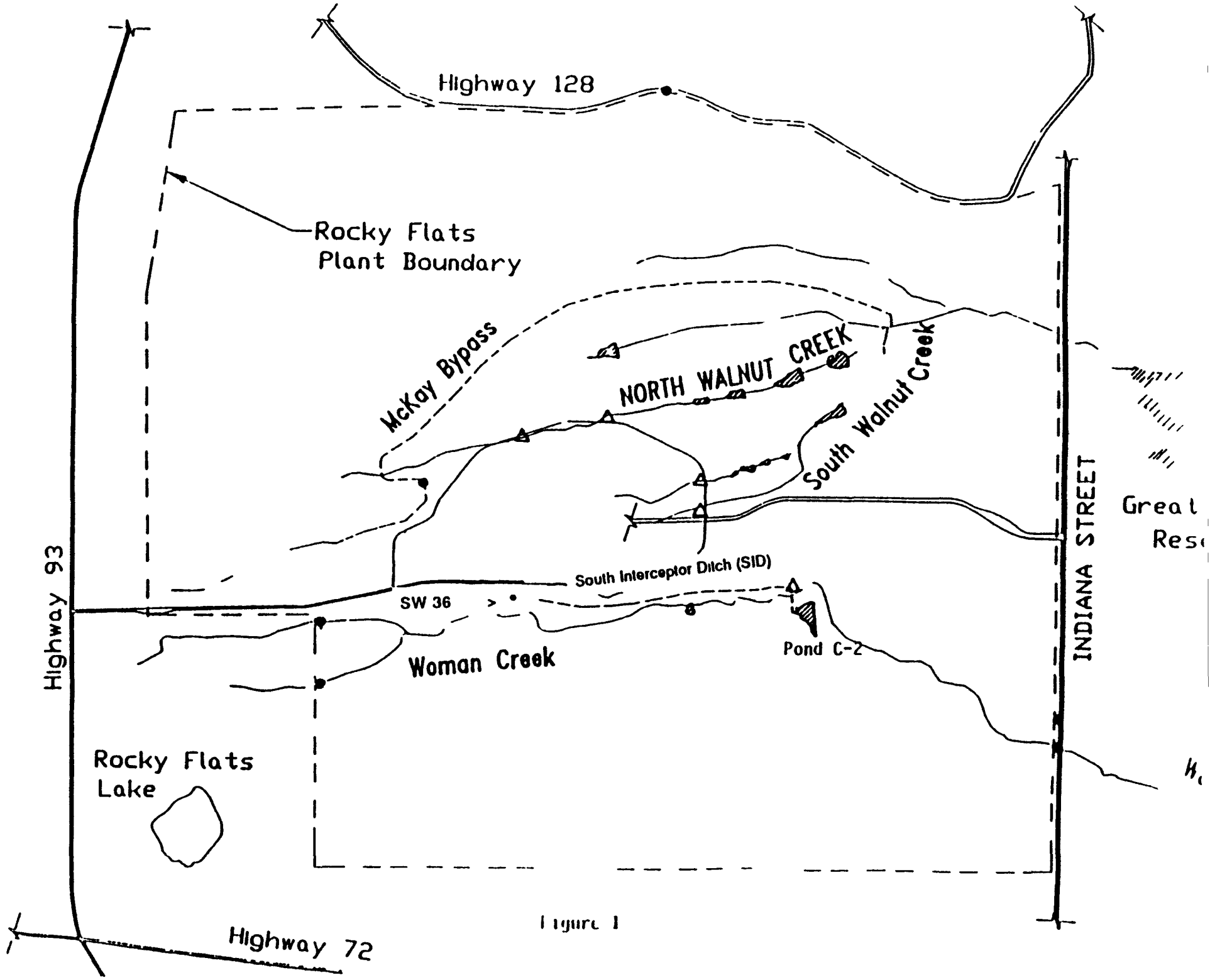
Highway 128
Rocky Flats
Plant Boundary
McKay Bypass
NORTH WALNUT CREEK
South Walnut Creek
INDIANA STREET
Great
Reso
Highway 93
South Interceptor Ditch (SID)
SW 36
Woman Creek
Pond C-2
Rocky Flats
Lake
Highway 72

Figure 1

ATTACHMENT A

HARRINGTON, FRED A
Biologist

PROFESSIONAL SUMMARY

Dr Harrington has 32 years of professional experience in the energy and natural resources fields He has performed a wide range of services including endangered species management mine land planning permitting and reclamation, baseline and monitoring studies mitigation planning regulatory reviews and fatal flaw evaluations parks and reserves planning design and management, and a wide range of land use planning activities He has served as project manager and principal investigator on projects throughout the Rocky Mountain region Northern Great Plains Pacific Northwest Desert Southwest and has worked for extended periods in Latin America and the Middle East. He is currently engaged in hazardous waste remedial investigations and related projects with the Department of Energy and the U S Army

Dr Harrington serves as Field Operations Leader for the Rocky Flats Plant biota baseline study under the Environmental Restoration Program and the Environmental Evaluation of Operable Unit (OU) 1 He has played a major role in developing standard operating procedures for biota investigations

EDUCATION

Ph D Wildlife Biology Colorado State University 1978
M S Natural Resources Administration Colorado State University 1969
B S Wildlife Biology Colorado State University 1959
Biology University of New Mexico 1955 56

ADDITIONAL TRAINING

Health and Safety Training Course 40 hours 1990
Industrial Ecology Institute Colorado School of Mines 1980
Business Administration Short Courses Harvard/University of Tehran, 1973 75
Alpine Ecology Summer Seminars University of Colorado 1966-1969
Business Administration University of Maryland USAFI 1964-1965

Dr Harrington has organized and attended a very large number of conferences conventions and seminars that included topics in industrial ecology ecological guidelines for land use marine biology endangered species management, mitigation, parks and reserves and international conservation issues

REGISTRATIONS AND CERTIFICATIONS

Registered Ecologist Registry of the International Union for the Conservation of Nature and Natural Resources
Certified International Diver Professional Association of Diving Instructors
Certified Flight Instructor (Airplane and Instruments) FAA
Certified Ground Instructor (Advanced and Instruments) FAA
Airline Transport Pilot Rating (Multi-engine) FAA

PROFESSIONAL AFFILIATIONS OR MEMBERSHIPS

Sigma Xi Ecological Society of America, American Society of Mammalogists American Ornithological Union, Society for Range Management, Wildlife Society International Union for the Conservation of Nature and Natural Resources American Institute of Biological Science Survival Service Commission

SECURITY CLEARANCES

Rocky Flats Red Badge
Department of Energy Q Clearance Pending

EBASCO EXPERIENCE

Dr Harrington joined EBASCO in 1990 He participates in a wide range of projects including the Rocky Mountain Arsenal (RMA) Hazardous Waste Remedial Investigation/Feasibility Study for the U S Army Program Manager s Office for the RMA Contamination Cleanup and the Rocky Flats Plant Monitoring Program for the Department of Energy (DOE) He is currently assigned as Field Operations Leader for the Rocky Flats Plant biota baseline study and for the Environmental Evaluation of OU 1

THREATENED AND ENDANGERED SPECIES EXPERIENCE

As an advisor to the Survival Service Commission (SSC) of the International Union for the Conservation of Nature and Natural Resources (IUCN) Dr Harrington played a major role in the creation and passage of CITES (Convention in Threatened and Endangered Species of Flora and Fauna) to which the United States and a majority of nations are now signatories

As chief advisor to the Iran Department of the Environment (under the former Shah) Dr Harrington was credited with developing a successful recovery plan for the Persian Fallow Deer the world s rarest deer He subsequently served with SSC s Deer Group in formulating recovery plans for other species of endangered cervids He worked with IUCN International Waterfowl Research Group (IWRB) International Council for Bird Preservation the Soviet Union Iran and the International Crane Foundation, in developing a recovery plan for the Siberian White Crane the Eurasian counterpart of the Whooping Crane He was credited with organizing the Ramsar Conference which led to ratification of the MARR list, protecting wetlands of international concern throughout Eurasia.

He developed a management plan for endangered bustards in the Middle East, and was the first to raise Great Bustards successfully in captivity He was involved in successful endangered species planning and management for the Marsh Crocodile, Caspian Snow Cock Caspian Salmon (a race of Brown Trout) and sea turtles in the Persian Gulf

Dr Harrington was engaged as an advisor by several other Middle Eastern nations including Bahrain Pakistan, and Saudi Arabia. He worked with the Government of Oman to develop nature preserves for the endangered Arabian Tahr and Muscat Gazelle.

Upon returning to the United States in 1979 Dr Harrington served as consultant and acting Western Regional Land Steward for the Nature Conservancy San Francisco In that capacity he was responsible for endangered species planning and management in the Conservancy s eighty western preserves. He prepared master plans that included endangered species recovery plans for Sycan Marsh, Oregon (Greater Sandhill Cranes) Pine Butte Swamp Montana (Grizzly Bears) Silver Creek, Idaho (McCloud Rainbow Trout)

Daudrich Northern Desert Shrub Reserve Idaho (endangered ecosystems) Birds-of Prey Reserve Idaho (falcons) Gila River Riparian Reserve New Mexico (endangered ecosystem) Dixon Dozier Sanctuary California (valley grassland vernal pools endangered flora, endangered invertebrates) Kipahulu Valley Maui Hawaii (endangered flora and birds) and many others

As a private consultant in recent years Dr Harrington has prepared dozens of endangered species evaluations and mitigation and management plans for government and industry He was responsible for preparation of the Trinity River Wildlife Management Options Study (Mitigation Planning) for the Bureau of Reclamation.

Dr Harrington has worked with the Commission of the Californias in preparation of plans for rare flora and fauna in Baja California. Similarly he has worked with the Secretaria de Desarrollo Urbano y Ecologia (SEDUE) the Universities of Chiapas and Colima Earthwatch, and the Institute for World Conservation and Development in planning for endangered species in Tamaulipas (oak/sweetgum biotic community ecology) Sian Kaan Biosphere Reserve Quintana Roo (coral reefs estuaries American crocodiles rare avifauna spider monkeys) Lagos de Montebello Chiapas (quetzals and orchids) Maruata Michoacan (spawning sea turtles) Zitacuaro Michoacan (wintering Monarch Butterflies) and other sites

PRIOR EXPERIENCE

Fred Harrington and Associates
Consulting Biologist and CEO (9 years)

Dr Harrington supervised a group of professional biologists and land use management specialists who offered a wide range of services including environmental services land use planning and biological studies During this period he served as project manager and principal investigator on numerous major energy projects in the Northern Great Plains and Rocky Mountain region including the Garrison Coal Field Powder River Basin and elsewhere on behalf of the coal and uranium industries Likewise he has worked with federal agency programs in the completion of extensive wildlife and vegetation inventories for the Bureau of Land Management. He coordinated an abandoned mine land reclamation project under contract to Wyoming Department of Environmental Quality Dr Harrington and his colleagues were engaged by a large number of nonprofit conservation organizations including the Nature Conservancy The Institute for World Conservation and Development and the International Union for Conservation of Nature and Natural Resources In recent years Dr Harrington devoted considerable time to investigations of the tropical rain forest degradation phenomenon throughout Latin America

VTN Wyoming Incorporated
Manager of Environmental Sciences (2 years)

For this multidisciplinary company Dr Harrington was responsible for program development, budget and finance marketing and quality control Principal activities were associated with environmental impact assessments in the Powder River Basin and adjacent areas Dr Harrington served to coordinate the activities of biologists sociologists geologists soil scientists economists archaeologists and several engineering disciplines He served as principal investigator on a variety of projects in the Northern Great Plains and Rocky Mountain region. He played a major role in the Bureau of Reclamation s Trinity River (California) Management Options Study He conducted the first environmental feasibility study for coal pipelines in the region.

Iran Department of the Environment
Chief Advisor (7 years)

Dr Harrington was employed by the Iranian government (under the former Shah) to supervise and conduct environmental studies Shortly thereafter he was given responsibility for preparation of the Iran National Report to the Stockholm International Conference on the Human Environment (UNEP UNDP UNESCO 1971) As a result of the favorable response to the report by the conferees he was asked to present plans for creation of the Iran Department of the Environment Plans were approved by Parliament in 1972 He was authorized to recruit 44 foreign advisors in the field of environmental conservation to assist in developing the program He subsequently guided the development of an organization with jurisdiction over environmental protection and pollution abatement, national parks and reserves fisheries wildlife plant protection and national museums He supervised the first studies of oil pollution in the Persian Gulf and proposed the first pollution abatement facilities at Iranian ports He conducted the first studies of pesticides in the Caspian Sea which led to a bilateral agreement on pesticide control and regulation between Iran and the Soviet Union. Dr Harrington was innovator of Pardisan a nature park complex near Tehran where he worked with such famous architects as Ian McHarg and R Buckminster Fuller The master plan won the annual award at the American Association of Landscape Architects in 1977

OTHER EXPERIENCE

Dr Harrington began his career as a biologist for New Mexico Game and Fish Department working on a federal aid project Investigations of Big Game and Ranges He served 5 years as Flight Navigator in the U S Air Force attaining the rank of Captain. During that period he was assigned to Military Airlift Command and served as a combat aircrew member in Vietnam in aeromedical evacuation and transport squadrons When he returned to graduate school he was engaged by the National Park Service to study habitat preferences of large mammals in Rocky Mountain National Park. For his efforts he was granted the Hibbs Award for Outstanding Contribution to Wildlife Management in the State of Colorado